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(71) Applicant (for all designated States except US): NITTA GE-LATIN INC. [JP/JP]; 8-12, Honmachi 1-chome, Chuo-ku, Osaka-shi, Osaka 541 (JP).		Published <i>With international search report.</i>	
(72) Inventors; and (75) Inventors/Applicants (for US only) : SUGIHARA, Fumihiro [JP/JP]; 393, Ohmachi, Kishiwada-shi, Osaka 596 (JP). ISHII, Takashi [JP/JP]; Room 302 Apple-Tennoji, 3-7-2, Daido, Tennoji-ku, Osaka-shi, Osaka 543 (JP). KURIHARA, Tooru [JP/JP]; 1-3-69-302, Aoyamadai, Suita-shi, Osaka 565 (JP).			
(54) Title: HARDENING MATERIAL FOR MEDICAL AND DENTAL USE			
(57) Abstract			
<p>A composition for medical or dental use containing a) a calcium phosphate powder composed of alaphatical calcium phosphate and/or tetracalcium phosphate, b) a setting liquid selected from acetic acid or inorganic acid, c) collagen or a collagen derivative. The composition hardens in a short time to a material which is analogous to and forms a sufficient bond with the hard tissue of the human body.</p>			

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DESCRIPTION

Hardening material for medical and dental use.

(Technical Field)

This invention relates to hardening materials for medical and dental service which are used as materials for medical or dental treatment of periodontal diseases, root canal sealing, broken bone filling, hard tissue adhesion and so on.

(Background Art)

As a therapeutic material for periodontal diseases, for example, a mixture of particles of hydroxyapatite (hereinafter referred to as HAp) or β -tricalcium phosphate ($\beta\text{-Ca}_3(\text{PO}_4)_2$) (hereinafter referred to as $\beta\text{-TCP}$) and a collagen solution was proposed (the Quintessence, 6(12), 1987).

On the other hand, as root canal sealing materials, for examples, a point such as a guttapercha point or a silver point has been used in combination with a paste agent such as calcium hydroxides or with a cement such as zinc oxide eugenol. A self-setting type apatite cement has also been proposed, which is obtained by mixing tetracalcium phosphate ($\text{Ca}_4(\text{PO}_4)_2\text{O}$) (generally referred to as 4CP) or TeCP and hereinafter as 4CP) containing barium apatite with a diluted phosphoric acid solution. The mixture is hardened at a neutral region, and the hardened substance has X-ray opaque character (a contrast character) (YUTAKA DOI et al., "J.J. Dent. Mat.", Special 11, 1988).

Regarding the above-described materials for medical treatment of periodontal diseases, its leakage can be prevented in a certain degree by adhesiveness of collagen to HAp or $\beta\text{-TCP}$ but a

chemical binding with tooth cementum can not be expected.

In the other hand, although a guttapercha point, which has been used in combination as a filling material for root canal, shows almost no cytotoxicity and no facile transformation in a body, it is not expected to have osteoconduction because it is a natural resin like gum.

Furthermore, the above-described self-setting type apatite cement is possible to form a calcified hard tissue and so, hopeful as a filling material for root canal, but it is not attained to make chemically a sufficient binding with hard tissue. Therefore, the filling and bonding are not enough, so that there exists a problem that a gap is formed between the apatite cement and hard tissue.

Thus, a subject of the present invention is to provide a hardening material for medical and dental service wherein a calcified hard tissue analogous to body hard tissue capable of making chemically a sufficient bond with body hard tissue is formed in a body within relatively short time passage.

(Disclosure of Invention)

To attain the above-described subject, the hardening materials for medical and dental service relating to the present invention in claims 1 and 2 are composed of a calcium phosphate powder and a hardening liquid and also of at least either one of collagen and/or collagen derivatives (hereinafter referred to as \lceil collagen \rceil) in a state of powder or solution, and the calcium phosphate powder contains a powder of α -tricalcium phosphate (α - $\text{Ca}_3(\text{PO}_4)_2$) (hereinafter referred as to \lceil α -TCP \rceil) and/or 4CP as an essential